

TOTAL MAXIMUM DAILY LOADs (TMDLs)

FOR THE

UPPER RIO CHAMA WATERSHED

(EI VADO RESERVOIR TO COLORADO BORDER)



September 9, 2003

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EXECUTIVE SUMMARY

Section 303(d) of the Federal Clean Water Act requires states to develop Total Maximum Daily Load (TMDL) management plans for water bodies determined to be water quality limited. A TMDL documents the amount of a pollutant a water body can assimilate without violating a state's water quality standards. It also allocates that load capacity to known point sources and nonpoint sources at a given flow. TMDLs are defined in 40 CFR Part 130 as the sum of the individual Waste Load Allocations (WLA) for point sources and Load Allocations (LA) for nonpoint sources, including a margin of safety and natural background conditions.

The Upper Rio Chama watershed, defined as the Rio Chama watershed upstream of El Vado reservoir, is located in north central New Mexico. It is a sub-basin of the Rio Grande Basin. Stations were located throughout the Upper Rio Chama watershed during the 1998 intensive watershed survey performed by the New Mexico Environment Department (NMED) Surface Water Quality Bureau (SWQB) to evaluate the impact of tributary streams. As a result of this monitoring effort, several exceedences of New Mexico water quality standards for temperature were documented on the Rio Chama (Rio Brazos to Little Willow Creek), Chavez Creek (Rio Brazos to headwaters), Rio Brazos (Rio Chama to Chavez Creek), and Rito de Tierra Amarilla (Rio Chama to State Highway 64). Samples taken at the lower Rito de Tierra Amarilla station also exceeded numeric turbidity criterion and the narrative stream bottom deposits (SBD) standard. Several exceedences of chronic aluminum criterion were documented on the Rio Chamita (Rio Chama to Colorado border). This TMDL document addresses the above noted impairments. TMDLs for temperature, ammonia, total phosphorus, and fecal coliform were previously completed for Rio Chamita (SWQB/NMED 1999a, 1999b). Accordingly, these efforts have completed TMDLs that address all currently measured impairments.

An implementation plan containing pollution abatement strategies for nonpoint source (NPS) pollution in the Upper Rio Chama watershed is included in this document. The Surface Water Quality Bureau's Watershed Protection Section developed the details of this plan.

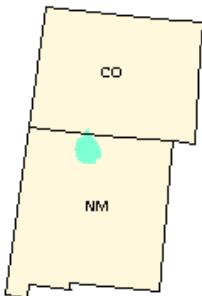
Implementation of recommendations in this document will be done with participation of all interested and affected parties. During implementation, additional water quality data will be collected by NMED during the standard rotational period for intensive stream surveys. As a result, targets will be re-examined and potentially revised as this document is considered to be an evolving management plan. In the event that new data indicate that the targets used in this analysis are not appropriate and/or if new standards are adopted, the load capacity will be adjusted accordingly. When water quality standards have been achieved, the reach will be removed from the TMDL list.

LIST OF ABBREVIATIONS

20.6.4 NMAC	New Mexico Water Quality Standards (as amended through October 11, 2002)
4Q3	4-day, 3-year low flow frequency
BMP	Best Management Practice
cfs	Cubic Feet per Second
CWA	Clean Water Act
CWAP	Clean Water Action Plan
CWF	Coldwater Fishery
EPA	Environmental Protection Agency
EPT	Ephemeroptera/Plecoptera/Tricoptera
FS	United States Department of Agriculture Forest Service
HQCWF	High Quality Coldwater Fishery
HBI	Hilsenhoff's Biotic Index
ISI	Interstitial Space Index
J/m ² /s	joules/meters squared/second
LA	Load Allocation
LCD	Local Climatological Data
MGD	Million Gallons per Day
mg/L	Milligrams per Liter
MOS	Margin of Safety
MOU	Memorandum of Understanding
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NMDGF	New Mexico Department of Game and Fish
NMSHTD	New Mexico State Highway and Transportation Department
NPDES	National Pollutant Discharge Elimination System
NPS	Nonpoint Source
NTU	Nephelometric Turbidity Units
QAPP	Quality Assurance Project Plan
SBD	Stream Bottom Deposits
SSTEMP	Stream Segment Temperature Model
SWQB	Surface Water Quality Bureau
TOC	Total Organic Carbon
TMDL	Total Maximum Daily Load
TSS	Total Suspended Solids
µg/L	micrograms per liter
USGS	United States Geological Survey
UWA	Unified Watershed Assessment
WLA	Waste Load Allocation
WQLS	Water Quality Limited Segment
WQCC	New Mexico Water Quality Control Commission
WQS	Water Quality Standards (NMAC 20.6.4 as amended through October 11, 2002)
WRAS	Watershed Restoration Action Strategy
WWTP	Wastewater Treatment Plant

TOTAL MAXIMUM DAILY LOAD SUMMARY TABLES

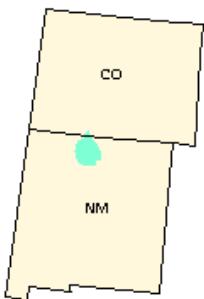
TOTAL MAXIMUM DAILY LOAD FOR CHRONIC ALUMINUM IN RIO CHAMITA (RIO CHAMA TO CO BORDER)



Summary Table

New Mexico Standards Segment	Rio Grande 20.6.4.119
Waterbody Identifier	Rio Chamita (Rio Chama to CO border) NM-2116.A_110 (formerly NM-URG2-30500), 13.58 miles
Parameters of Concern	Chronic Aluminum
Uses Affected	High Quality Coldwater Fishery
Geographic Location	Rio Chama USGS Hydrologic Unit Code 13020102
Scope/size of Watershed	38 mi ²
Land Type	Southern Rockies Ecoregion (21)
Land Use/Cover	Rangeland (33%), Forest (67%), Urban/Water (<1%), Agriculture (<1%)
Identified Sources	Flow Regulation/Modification, Removal of Riparian Vegetation, Municipal Point Sources, Natural Sources
Land Management	State land (94%), Private (6%)
Priority Ranking	2
Threatened and Endangered Species	None
TMDL for: Chronic Aluminum	WLA (0.4) + LA (9.8) + MOS (2.6)= 12.8 lbs/day

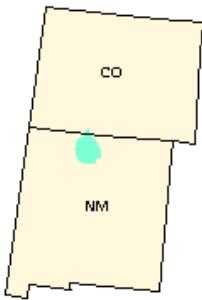
**TOTAL MAXIMUM DAILY LOAD FOR
TEMPERATURE
IN
RIO CHAMA (RIO BRAZOS TO LITTLE WILLOW CREEK)**



Summary Table

New Mexico Standards Segment	Rio Grande 20.6.4.119
Waterbody Identifier	Rio Chama (Rio Brazos to Little Willow Creek) NM-2116.A_001 (formerly NM-URG2-30000), 11.72 miles
Parameters of Concern	Temperature
Uses Affected	High Quality Coldwater Fishery
Geographic Location	Rio Chama USGS Hydrologic Unit Code 13020102
Scope/size of Watershed	221 mi ² (upstream of confluence with the Rio Brazos)
Land Type	Southern Rockies Ecoregion (21)
Land Use/Cover	Range (16%), Forest (80%), Agriculture (4%), Urban/Water (<1%)
Identified Sources	Range Grazing -- Riparian or Upland, Removal of Riparian Vegetation, Flow Regulation/Modification
Land Management	Private (85%), USFS (1%), State (14%)
Priority Ranking	4
Threatened and Endangered Species	None
TMDL for: Temperature	WLA (0) + LA (194.82) + MOS (22.38) = 217.20 joules/meter²/second/day

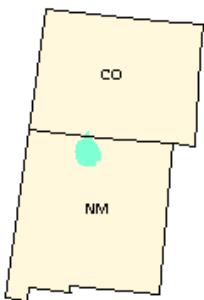
**TOTAL MAXIMUM DAILY LOAD FOR
TEMPERATURE
IN
CHAVEZ CREEK (RIO BRAZOS TO HEADWATERS)**



Summary Table

New Mexico Standards Segment	Rio Grande 20.6.4.119
Waterbody Identifier	Chavez Creek (Rio Brazos to headwaters) NM-2116.A_081 (formerly NM-URG2-30210), 12.59 miles
Parameters of Concern	Temperature
Uses Affected	High Quality Coldwater Fishery
Geographic Location	Rio Chama USGS Hydrologic Unit Code 13020102
Scope/size of Watershed	25 mi ²
Land Type	Southern Rockies Ecoregion (21)
Land Use/Cover	Forest (92%), Rangeland (8%), Urban/Water (<1%), Agriculture (<1%)
Identified Sources	Range Grazing -- Riparian or Upland, Removal of Riparian Vegetation, Flow Regulation/Modification, Dredging, Gravel Mining
Land Management	Private (100%)
Priority Ranking	4
Threatened and Endangered Species	None
TMDL for: Temperature	WLA (0) + LA (173.52) + MOS (21.03) = 194.55 joules/meter²/second/day

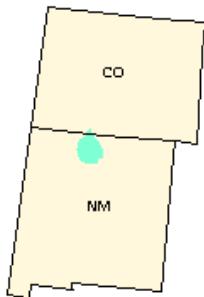
**TOTAL MAXIMUM DAILY LOAD FOR
TEMPERATURE
IN
RIO BRAZOS (RIO CHAMA TO CHAVEZ CREEK)**



Summary Table

New Mexico Standards Segment	Rio Grande 20.6.4.119
Waterbody Identifier	Rio Brazos (Rio Chama to Chavez Creek) NM-2116.A_080 (formerly NM-URG2-30200), 3.52 miles
Parameters of Concern	Temperature
Uses Affected	High Quality Coldwater Fishery
Geographic Location	Rio Chama USGS Hydrologic Unit Code 13020102
Scope/size of Watershed	171 mi ²
Land Type	Southern Rockies Ecoregion (21)
Land Use/Cover	Forest (64%), Rangeland (30%), Agriculture (6%), Urban/Water (<1%)
Identified Sources	Range Grazing -- Riparian or Upland, Removal of Riparian Vegetation, Flow Regulation/Modification, Dredging, Gravel Mining, Channelization, Unmaintained Low Water Crossing
Land Management	Private (96%), USFS (4%)
Priority Ranking	4
Threatened and Endangered Species	None
TMDL for: Temperature	WLA (0) + LA (184.89) + MOS (20.54) = 205.43 joules/meter²/second/day

**TOTAL MAXIMUM DAILY LOAD FOR
TURBIDITY, STREAM BOTTOM DEPOSITS, AND TEMPERATURE
IN
RITO DE TIERRA AMARILLA (RIO CHAMA TO HWY 64)**



Summary Table

New Mexico Standards Segment	Rio Grande 20.6.4.119
Waterbody Identifier	Rito de Tierra Amarilla (Rio Chama to HWY 64) NM-2116.A 070 (formerly NM-URG2-30100), 15.8 mi
Parameters of Concern	Turbidity Stream Bottom Deposits Temperature
Uses Affected	High Quality Coldwater Fishery
Geographic Location	Rio Chama USGS Hydrologic Unit Code 13020102
Scope/size of Watershed	61.3 mi ²
Land Type	Southern Rockies Ecoregion (21)
Land Use/Cover	Forest (70%), Rangeland (25%), Agriculture (5%), Urban/Water (<1%)
Identified Sources	Range Grazing -- Riparian or Upland, Removal of Riparian Vegetation, Road Maintenance and Runoff, Flow Regulation/Modification, Agriculture
Land Management	Private (100%)
Priority Ranking	4
Threatened and Endangered Species	None
TMDL for:	
Turbidity (as TSS)	WLA(0) + LA(1296.4) + MOS(432.2)= 1728.6 lbs/day
Stream Bottom Deposits	WLA(0) + LA (15) + MOS(5)= 20% fines
Temperature	WLA (0) + LA(150.85) + MOS (16.76) = 167.61 joules/meter²/second/day